

What Is Claimed Is:

1. A plasma display panel having a row direction and a column direction, the row direction corresponding to a display line direction of the plasma display panel, comprising:

a front substrate having an outer surface and an inner surface;

a plurality of row electrodes extending in the row direction on the inner surface of the front substrate, the plurality of row electrodes being parallel to each other and spaced from each other in the column direction, each display line of the plasma display panel being defined by paired two adjacent row electrodes, one of each said paired two adjacent row electrodes being used in a next paired two adjacent row electrodes to define a next display line;

a rear substrate having an outer surface and an inner surface such that the inner surface of the rear substrate faces the inner surface of the front substrate, a discharge space being formed between the inner surface of the front substrate and the inner surface of the rear substrate;

a dielectric layer formed on the inner surface of the front substrate for covering the plurality of row electrodes;

a plurality of column electrodes extending in the column direction on the inner surface of the rear substrate, the plurality of column electrodes being parallel to each other and spaced from each other in the row direction;

a plurality of unit light-emission areas formed in the discharge space at intersections of the plurality of row

electrodes and column electrodes such that two said row electrodes and one said column electrode are associated with each said unit light-emission area;

a partition wall matrix provided between the front and rear substrates for partitioning the plurality of unit light-emission areas from each other;

a plurality of separation walls provided between the front and rear substrates such that each said separation wall divides each said unit light-emission area into a first discharge cell, in which discharge occurs across the paired two adjacent row electrodes associated with the each unit light-emission area, and a second discharge cell, in which discharge occurs across one of the paired two adjacent row electrodes and the column electrode associated with the each unit light-emission area; and

a plurality of passages formed in the plurality of unit light-emission areas respectively, such that each said passage communicates the first discharge cell with the second discharge cell of each said unit light-emission area.

2. The plasma display panel according to claim 1, wherein each of the plurality of row electrodes includes a main portion extending in the row direction, and a plurality of two branching portions extending oppositely from the main portion in the column direction, one of the two branching portions of each said row electrode extends in the unit light-emission area concerned, the other branching portion extends in an adjacent unit light-emission area of the column direction, each said

branching portion extends toward another branching portion extending from an adjacent row electrode, and each said branching portion has a T shape and has a free end, and

wherein the free end of each said branching portion is exposed to the free end of an adjacent branching portion over a first discharge gap in each said first discharge cell, and the main portion of each said row electrode is exposed to the associated column electrode over a second discharge gap in each said second discharge cell.

3. The plasma display panel according to claim 1 further including a black layer provided on the inner surface of the front substrate in each said second discharge cell.

4. The plasma display panel according to claim 1 further including a secondary electron emission layer provided on the inner surface of the rear substrate in each said second discharge cell.

5. The plasma display panel according to claim 1 further including a fluorescent layer formed on only the inner surface of the front substrate in each said first discharge cell.

6. A display device for displaying an image corresponding to an input image signal, based on pixel data of pixels derived from the input image signal, the display device being operated with a plurality of subfields, the plurality of subfields being obtained by dividing one field display period by a certain number, each of the plurality of subfields including an addressing interval and a sustain interval, the plurality of subfields consisting of a first subfield to a last

subfield, the display device comprising:

a plasma display panel having a row direction and a column direction, the row direction corresponding to a display line direction of the plasma display panel, the plasma display panel including:

a front substrate having an outer surface and an inner surface,

a plurality of row electrodes extending in the row direction on the inner surface of the front substrate, the plurality of row electrodes being parallel to each other and spaced from each other in the column direction, each display line of the plasma display panel being defined by paired two adjacent row electrodes, the plurality of row electrodes defining a first display line to a last display line, one of each said paired two adjacent row electrodes being used in a next paired two adjacent row electrodes to define a next display line,

a rear substrate having an outer surface and an inner surface such that the inner surface of the rear substrate faces the inner surface of the front substrate, a discharge space being formed between the inner surface of the front substrate and the inner surface of the rear substrate,

a dielectric layer formed on the inner surface of the front substrate for covering the plurality of row electrodes,

a plurality of column electrodes extending in the

column direction on the inner surface of the rear substrate, the plurality of column electrodes being parallel to each other and spaced from each other in the row direction,

a plurality of unit light-emission areas formed in the discharge space at intersections of the plurality of row electrodes and column electrodes such that two said row electrodes and one said column electrode are associated with each said unit light-emission area,

a partition wall matrix provided between the front and rear substrates for partitioning the plurality of unit light-emission areas from each other,

a plurality of separation walls provided between the front and rear substrates such that each said separation wall divides each said unit light-emission area into a first discharge cell, in which discharge occurs across the paired two adjacent row electrodes associated with the each unit light-emission area, and a second discharge cell, in which discharge occurs across one of the paired two adjacent row electrodes and the column electrode associated with the each unit light-emission area, and

a plurality of passages formed in the plurality of unit light-emission areas respectively, such that each said passage communicates the first discharge cell with the second discharge cell of each said unit light-emission area;

an addressing circuit for applying a positive scan pulse to one of each said paired two adjacent row electrodes in the address interval from the first display line to the last display line sequentially, and for applying pixel data pulses derived from the pixel data to the plurality of column electrodes, for one display line at a time, in synchronization with the positive scan pulse when the plurality of column electrodes are a cathode, thereby selectively inducing address discharge in the second discharge cells; and

a sustaining circuit for applying a sustain pulse to each said paired two adjacent row electrodes in the sustain interval.

7. The display device according to claim 6, wherein the sustaining circuit applies the sustain pulse, having a negative polarity, to said one of each said paired two adjacent row electrodes for all the display lines in the sustain interval of the last subfield.

8. The display device according to claim 6, wherein the addressing circuit causes the induced address discharge to propagate from the second discharge cells to the associated first discharge cells, thereby setting the first discharge cells into a lit condition or an extinguished condition.

9. The display device according to claim 6, wherein each of the plurality of row electrodes includes a main portion extending in the row direction, and a plurality of two branching portions extending oppositely from the main portion in the column direction, one of the two branching portions of each said row electrode extends in the unit light-emission area concerned,

the other branching portion extends in an adjacent unit light-emission area of the column direction, each said branching portion extends toward another branching portion extending from an adjacent row electrode, and each said branching portion has a T shape and has a free end, and

wherein the free end of each said branching portion is exposed to the free end of an adjacent branching portion over a first discharge gap in each said first discharge cell, and the main portion of each said row electrode is exposed to the associated column electrode over a second discharge gap in each said second discharge cell.

10. The display device according to claim 6 further including a black layer provided on the inner surface of the front substrate in each said second discharge cell.

11. The display device according to claim 6 further including a secondary electron emission layer provided on the inner surface of the rear substrate in each said second discharge cell.

12. The display device according to claim 6 further including a fluorescent layer formed on only the inner surface of the front substrate in each said first discharge cell.

13. The display device according to claim 6, wherein discharge spaces of the second discharge cells are completely compartmented from each other by the partition wall matrix, and each said discharge space of each said second discharge cell is communicated with a discharge space of said first discharge cell in an adjacent unit light-emission area of the row direction.

14. The display device according to claim 6 further including a reset circuit for applying a reset pulse to said one of each said paired two adjacent row electrodes and the column electrodes, prior to the address discharge of the addressing circuit, thereby inducing reset discharge in the second discharge cell concerned.

15. The display device according to claim 14, wherein the reset pulse has a waveform which changes gentler than the sustain pulse in a rising edge and a falling edge.

16. The display device according to claim 14, wherein the reset circuit induces the reset discharge in odd display lines and in even display lines at different timing.

17. The display device according to claim 6, wherein the addressing circuit induces the address discharge in odd display lines and in even display lines at different timing.